

LISTING OF CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claims 1-21 (Canceled):

Claim 22 (Previously Presented): A deficiency inspection method based on a magnetic-particle inspection scheme, comprising the steps of:

- irradiating an ultraviolet light on a surface of a specimen on which a magnetic particle is coated;
- picking up an image on a surface of a specimen by using a color camera through a filter which filters the ultraviolet light;
- detecting a deficiency candidate on said surface by using a green (G) signal component of said image acquired by said color camera;
- displaying an image of said detected deficiency candidate on a screen; and
- storing the displayed image in a memory.

Claim 23 (Previously Presented): The deficiency inspection method according to claim 22, wherein the deficiency candidate on said surface is detected by using information of luminance of said green (G) signal component of said image.

Claim 24 (Previously Presented): A deficiency inspection method based on a magnetic-particle inspection scheme, comprising the steps of:

irradiating ultraviolet rays on a surface of a specimen to which a solution containing fluorescent magnetic powder is applied;

picking up an image of said surface irradiated with said ultraviolet rays by a color camera through a filter which filters said ultraviolet rays; and

displaying an image acquired by said color camera on a screen in nearly the same state as an image acquired by visually observing said surface irradiated with said ultraviolet rays.

Claim 25 (Previously Presented): A deficiency inspection method based on a magnetic-particle inspection scheme, comprising the steps of:

irradiating ultraviolet rays on a surface of a specimen to which a solution containing fluorescent magnetic powder is applied;

picking up an image of said surface irradiated with said ultraviolet rays by a color camera via an ultraviolet-rays cutting filter;

extracting deficiency candidates from an image acquired by said color camera; and

displaying on a screen images of the extracted deficiency candidates.

Claim 26 (Previously Presented): A deficiency inspection method based on a penetrant inspection scheme, comprising the steps of:

picking up an image of a surface of a specimen by using a color camera;

converting RGB data of the picked-up image to chromaticity and luminance;

and

detecting a deficiency candidate on said surface by using information of said chromaticity and luminance converted from said RGB data of the picked-up image.

Claim 27 (Previously Presented): A deficiency inspection method based on a penetrant-inspection scheme, comprising the steps of:

- illuminating a surface of a specimen with polarized light;
- picking up an image of said surface illuminated with said polarized light by a color camera via a polarization filter, wherein said color camera is calibrated by using camera calibration color chart for inspection;
- extracting deficiency candidates from said image acquired by said color camera; and
- displaying images of said extracted deficiency candidates on a screen.

Claim 28 (Currently Amended): A deficiency inspection method for magnetic-particle-inspection or penetrant-inspection, comprising the steps of:

- picking up an image of a surface of a specimen by a color camera with positional information of a visual field of said color camera which is calibrated by using camera calibration color chart for inspection;
- detecting deficiency candidates in said surface by processing a color signal of said image acquired by said color camera; and
- displaying images of said detected deficiency candidates on a screen together with said positional information of said visual field.

Claim 29 (Previously Presented): The deficiency inspection method according to claim 28, wherein said positional information of said visual field is originated from a scale arranged in said visual field.

Claim 30 (Previously Presented): The deficiency inspection method according to any one of claims 22-29, wherein said image of said surface is picked up by said color camera over plural visual fields.

Claim 31 (Previously Presented): A deficiency inspection method for magnetic-particle-inspection or penetrant inspection, comprising the steps of:

- illuminating a specimen with light;
- taking an image of a surface of the specimen by a camera through a filter which filters the light reflected from said surface by the illumination;
- detecting deficiency candidates in said surface from said image taken by said camera;
- displaying images of said extracted deficiency candidates on a screen; and
- distinguishing a pseudo deficiency among said images of said extracted deficiency candidates displayed on said screen.

Claim 32 (Previously Presented): A deficiency inspection method comprising the steps of:

- picking up an image of a surface of a specimen by image pickup means;
- detecting deficiency candidates on said surface among said image acquired by said image pickup means;

displaying images of detected deficiency candidates on a screen; and
storing displayed images of said detected deficiency candidates with
information of feature characteristics of said deficiency candidates in a memory.

Claim 33 (Previously Presented): A deficiency inspection apparatus for
magnetic-particle-inspection or penetrant inspection, comprising:

illumination means for illuminating a surface of a specimen on which a
magnetic particle is coated;

image pickup means for picking up an image of said surface by a color
camera through a filter;

deficiency-candidate detecting means for detecting deficiency candidates
from a green (G) signal component of said image picked up by said image pickup
means; and

display means for displaying images of said deficiency candidates detected by
said deficiency-candidate detecting means.

Claim 34 (Previously Presented): The deficiency inspection apparatus
according to claim 33, wherein said illumination means has an ultraviolet-rays
illuminating section for illuminating ultraviolet rays onto said surface of said
specimen, and a white-light illuminating section for illuminating white light onto said
surface of said specimen.

Claim 35 (Previously Presented): A deficiency inspection apparatus,
comprising:

illumination means for illuminating a surface of a specimen;

image pickup means for picking up an image of said surface by a color camera, which is calibrated by using camera calibration color chart for inspection;

magnetic-particle-inspection-originated deficiency-candidate extraction means for extracting magnetic-particle-inspection originated deficiency candidates in said surface from said image of said surface picked up by said image pickup means;

penetrant-inspection-originated deficiency-candidate extraction means for extracting penetrant-inspection-originated deficiency candidates in said surface from said image of said surface picked up by said image pickup means; and

display means for displaying images of said deficiency candidates detected by said magnetic-particle-inspection-originated deficiency-candidate extraction means or said penetrant-inspection-originated deficiency-candidate extraction means.

Claim 36 (Previously Presented): A deficiency inspection apparatus for magnetic-particle-inspection or penetrant inspection, comprising:

an illuminator which illuminates a surface of a specimen;

a camera which picks up an image of said surface;

a deficiency-candidate detector which detects deficiency candidates on said surface from said image of said surface picked up by said camera by using a green (G) signal component of said image;

a storage section which stores images of said deficiency candidates detected by said deficiency-candidate detector; and

a display unit which displays information of said images of said deficiency candidates stored in said storage section on a screen.

Claim 37 (Previously Presented): A deficiency inspection apparatus,
comprising:

ultraviolet-rays irradiation means for irradiating ultraviolet rays onto a surface
of a specimen to which a solution containing fluorescent magnetic powder is applied;

image pickup means for picking up an image of said surface irradiated with
said ultraviolet rays by a color camera through a filter which filters said ultraviolet
rays; and

display means for displaying said image of said surface picked up by said
image pickup means on a screen in nearly the same state as an image acquired by
said visual observation.

Claim 38 (Previously Presented): A deficiency inspection apparatus
based on a probing scheme, comprising:

illuminating means for illuminating light on a surface of a specimen to which a
penetrant inspection treatment is applied;

image pickup means for picking up an image of said surface illuminated with
said light by a color camera, which is calibrated by using camera calibration color
chart for inspection;

converter means for converting RGB data of the image picked-up by said
image pickup means to chromaticity and luminance;

deficiency-candidate detecting means for detecting deficiency candidates by
using information of said chromaticity and luminance of said image; and

display means for displaying images of said deficiency candidates detected by said deficiency-candidate detecting means.

Claim 39 (Previously Presented): A deficiency inspection apparatus, comprising:

illuminating means for illuminating light on a surface of a specimen to which a penetrant-inspection treatment is applied;

image pickup means for picking up an image of said surface illuminated by said illuminating means by a color camera;

converter means for converting RGB data of the image picked-up by said image pickup means to chromaticity and luminance;

deficiency-candidate detecting means for detecting deficiency candidates on said surface from said image picked-up by said color camera of said image pickup means;

display means for displaying images of said deficiency candidates detected by said deficiency-candidate detecting means; and

memory means for storing displayed images with data of chromaticity and luminance obtained by said converter means.

Claim 40 (Previously Presented): A deficiency inspection apparatus, comprising:

illumination means for illuminating a surface of a specimen to which a penetrant is temporarily applied with white light;

image pickup means for picking up an image of said surface by a color camera which is calibrated by using camera calibration color chart for inspection camera;

magnetic-particle-inspection-originated deficiency-candidate detecting means for detecting magnetic-particle-inspection originated deficiency candidates on said surface from a green (G) signal component of said image of said surface picked up by said image pickup means;

penetrant-inspection-originated deficiency-candidate detecting means for detecting penetrant-inspection-originated deficiency candidates on said surface from said image picked up by said image pickup means; and

display means for displaying images of said deficiency candidates detected by said magnetic-particle-inspection-originated deficiency-candidate detecting means or said penetrant-inspection-originated deficiency-candidate detecting means.

Claim 41 (Currently Amended): The deficiency inspection apparatus according to any one of claims 33 to 40, further ~~comprising~~comprising positional information display means arranged in a visual field of said color camera, for displaying positional information of said visual field of said color camera.

Claim 42 (Previously Presented): The deficiency inspection apparatus according to claim 40, wherein said positional information display means is a scale.